

Section 4

General Plan - Component Plan Overview

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Section 4

General Plan - Component Plan Overview



4.1 GENERAL PLAN COMPONENTS

Component plans provide the narrative discussion and graphic illustration for developing the findings and recommendations of this document. The following four component plans, along with their supporting detailed element plans, are summarized, and pertinent information is illustrated with maps.

4.1.1 Composite Constraints and Opportunities Component

This component provides information about the natural and man-

made environment that can limit or expand the mission and support capability of installation property. The integration and analysis of this information identifies areas with limited or specialized development potential.

4.1.2 Infrastructure Component

The Infrastructure Component provides an overview of utility, communications, and road systems. It is important to understand the different engineering systems capacities to meet mission requirements and development needs.

*Goodfellow AFB
South Gate*



4.1.3 Land Use Component

The Land Use Component identifies and analyzes the functional relationship of activities that occur on the installation and their importance in terms of proximity to one another.

4.1.4 Capital Improvements Program (CIP) Component

This component describes program elements associated with base development such as architectural compatibility guidelines, landscape development guidelines, and demolition program. The CIP also identifies major facility projects for various program avenues in conformance with the Facility Board approved programs.

4.1.5 Relationship of Component Plans

Each component is a summary of the various studies, reports, documents, and research previously accomplished. The structure of the component plans provides an appropriate scope of detailed, accurate information.

The General Plan contains only a schematic representation of utility systems. Mapping and other data maintained by the Base Civil Engineer contain line diameters, materials, elevations, and other information important to the development and maintenance of the utility systems.

4.2 COMPOSITE CONSTRAINTS AND OPPORTUNITIES

The Constraints and Opportunities Component addresses information on the natural and man-made environments that affect the installation.

Constraints are more easily seen and understood than opportunities. Constraints could include cultural resources management and environmental remediation that require strict adherence to established guidance during renovations and new construction.

Conversely, opportunities presented to the base are not only for future development and expansion of facilities, but include opportunities to enhance the base's visual setting and quality of life.

The following paragraphs identify those features that may constrain or provide opportunities for base development and/or add to its quality of life. Figure 4.1 provides information on environmental constraints and opportunities. Figure 4.2 illustrates operational constraints that result from operations, clearances, and safety distances. These figures are compiled from figures that follow later in this section and identify the specific environmental and operational constraints.

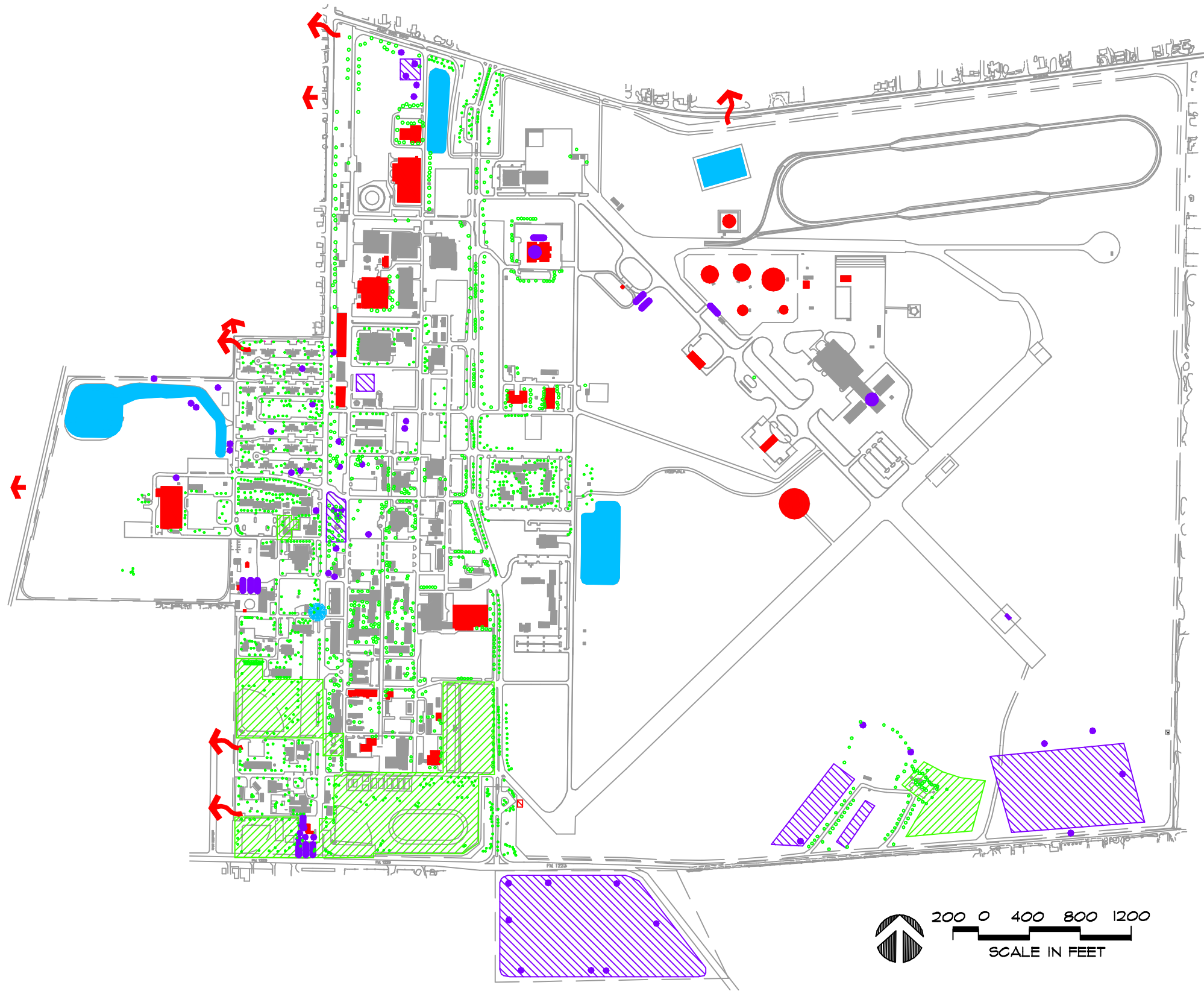
4.2.1 Natural, Cultural, and Man-Made Resources

The natural, cultural, and man-made resource elements of the area can impact future development by the following physical and environmental constraints or opportunities.

4.2.1.1 Climate The San Angelo area experiences a semi-arid climate with mild dry winters and hot summers. The annual average

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Figure 4.1
Environmental
Constraints and
Opportunities



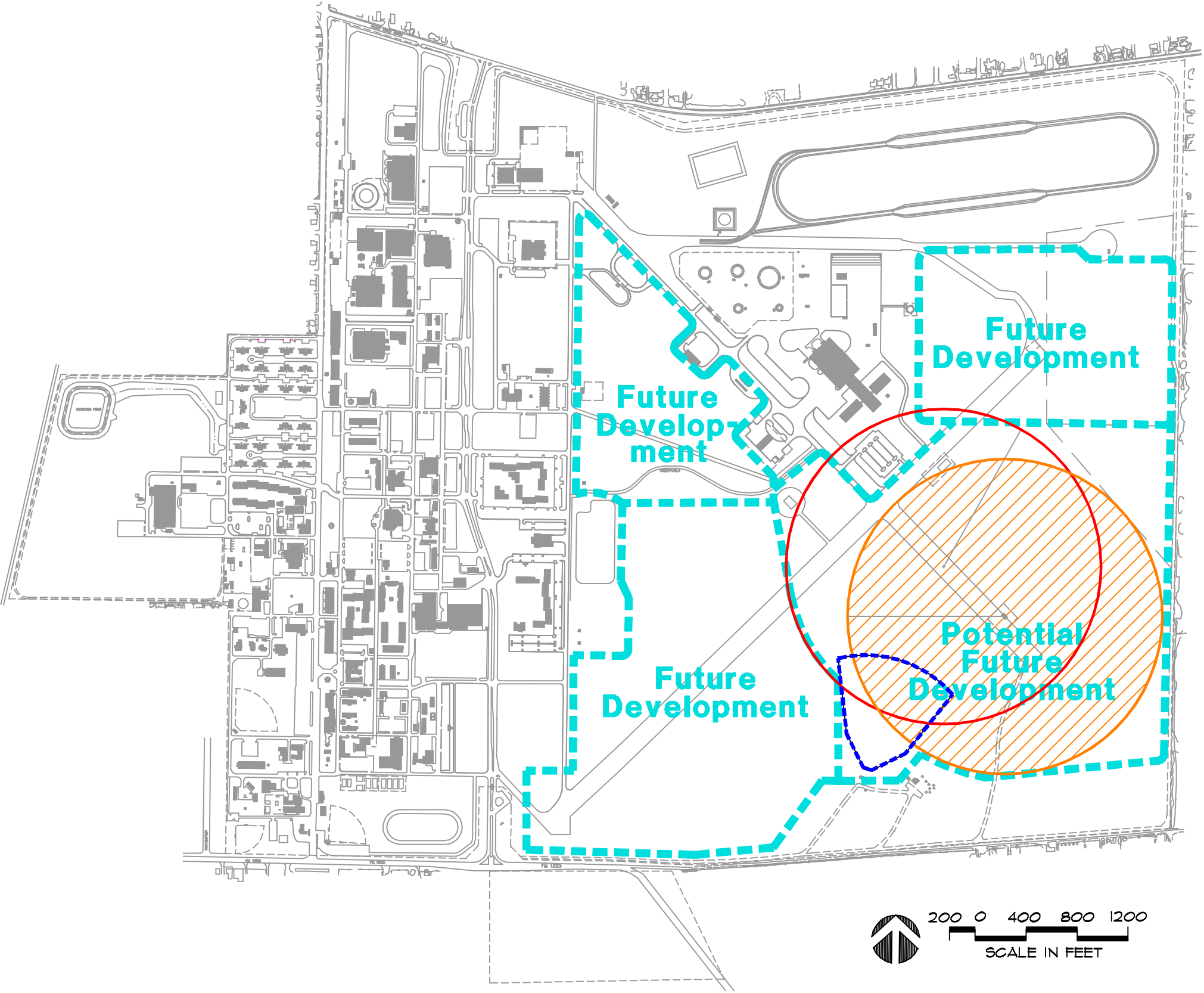
- Natural and Cultural Resources**
 - Historic Landmark
 - Detention Basin
- Management Areas**
 - Outdoor Recreation
 - Vegetation
- Environmental Quality**
 - Hazardous Waste Accumulation Site/Point
 - UST and AST Tanks
 - IRP Site
 - Monitoring Well
- Environmental Emissions**
 - Air Emission
 - Storm Water Discharge
 - Waste Water Discharge

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Figure 4.2

Operational Constraints and Opportunities



-  Clear Zone Outdoor Firing Range
-  Future Development Area
-  Quantity Safety Distance Zone
-  Clear Zone Suspect Vehicle Holding Area

temperature is 64.9 degrees Fahrenheit. January is typically the coldest month with an average normal temperature of 43.7 degrees, and the warmest month is July with an average normal temperature of 82.7 degrees. Although regional precipitation totals vary greatly from year to year, the average annual rainfall is around 20 inches per year with the majority of it received during the months of May, June, and September. This area enjoys a frost-free growing season of approximately 235 days occurring from late March to mid-November. Prevailing winds are southerly during the summer months, shifting to southwesterly to westerly during winter and early spring.

4.2.1.2 Geology and Physiography

Goodfellow AFB lies within a broad open area known as the Concho River Valley, located within the Osage Plains of the Central Lowlands physiographic region. Situated between the Texas Hill Country and the Rolling Plains, the valley is approximately 65 to 80 miles wide running predominately east to west. The nearly level valley was created by the Concho River and its tributaries eroding through the limestone beds of the Edwards Plateau. The predominant geological formation of this region consists of alluvial deposits from the Quaternary period. The base lies on a bedrock surface formed on the Choza formation, de-

Fire Training Complex



veloped during the Pleistocene Epoch and in more recent times. Depth to bedrock is from 5 to over 20 feet.

4.2.1.3 Topography The terrain in this region is nearly level to gently rolling, sloping from south to north. To the northwest is the Rolling Plains, and to the south the terrain becomes rugged as it reaches the edge of the Chihuahuan Desert. As illustrated in Figure 4.3, land within the cantonment area drains southeast to northwest, and the former airfield area drains from southwest to northeast. Base elevations range from 1,835 feet at the stormwater outfall north of the fire training area to 1,875 feet near the south gate.

4.2.1.4 Hydrology Primary waterways of this region include the North Concho, the Middle Concho, and the South Concho rivers, which all converge in the San Angelo area to form the main Concho River. Each tributary supplies one of three prominent surface reservoirs in the area. The O.C. Fisher Lake is fed by the North Concho River; the Twin Buttes Reservoir is established on both the Middle and South Concho rivers; and farther downstream from Twin Buttes is Lake Nasworthy. These impoundments are the primary sources of the domestic water supply for the city of San Angelo, and subsequently Goodfellow AFB. In addition, the E.V. Spence Reservoir, 35 miles north of town, and the O.H. Ivey Reservoir, 40 miles east of town, supply water during periods of drought. Although there appears to be an abundant amount of water

available to the area, recent years of drought, coupled with a diminishing water table have caused concerns about maintaining a reliable water supply.

There are no significant surface water impoundments located on the installation, although there are three detention ponds and some drainage ditches and depressions that detain water during heavy rains.

4.2.1.5 Soils Soil properties are important to the planning process as they can determine the vegetative, environmental, and physical construction potentials at a proposed site. Figure 4.4 graphically illustrates the different soil types occurring at Goodfellow AFB.

Goodfellow AFB is located predominately within the Kimbrough-Mereta-Angelo soil association. This association is typical of the outwash plains located in the broad valleys of the Concho River tributaries. It is characterized by very shallow to deep, nearly level to sloping, and undulating terrain made up of clayey and calcareous soils.

These soils are typically well-drained with predominantly slow runoff characteristics. Permeability is described as slow to moderate. Most of the soils in this association are suitable for crops, rangeland, and landscaping. However, they are considered to be highly corrosive to uncoated steel infrastructure. They typically have a moderate to high shrink swell potential, which can lead to difficulties stabilizing founda-

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Figure 4.3

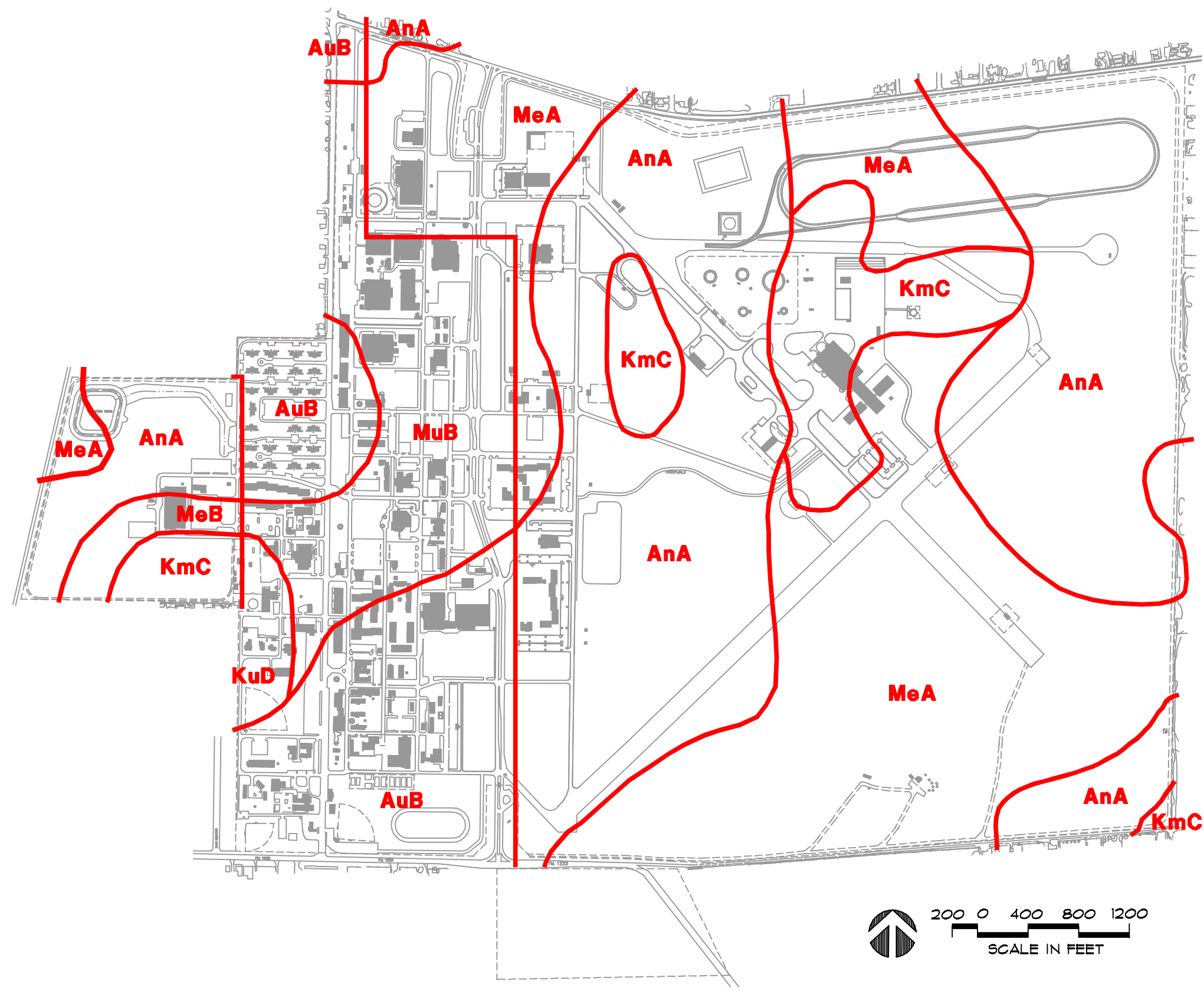
Topography



Topography Contour

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Figure 4.4
Soils



- AnA** Angelo clay loam
(0 to 1 percent slope)
- AuB** Angelo-Urban land complex
(0 to 3 percent slope)
- KmC** Kimbrough association
(Undulating)
- KuD** Kimbrough-Urban land complex
(1 to 3 percent slope)
- MeA** Mereta clay loam
(0 to 1 percent slope)
- MeB** Mereta clay loam
(1 to 3 percent slope)
- MuB** Mereta-Urban land complex
(0 to 3 percent slope)



Regional vegetation

tions and pavements. In some areas, shallow deposits of caliche can make excavations and/or planting difficult.

4.2.1.6 Flood plain There are no areas within Goodfellow AFB that fall within the 100- or 500-year flood plain.

4.2.1.7 Wetlands No areas on this installation contain the proper combination of water, soil types, and vegetative species to be considered wetlands.

4.2.1.8 Vegetation Originally, this region probably consisted of short to midgrass grasslands that included species such as sideoats grama, little bluestem, blue grama, and switchgrass. It is likely that heavy grazing over the years has altered the vegetative species to include more invasive woody species such as mesquite, buckley yucca, and pricklypear cactus.

Infrequency of mowing and fire suppression over the semi-improved and unimproved lands on base have caused the majority of these areas to develop into mesquite savannas and grasslands containing the previously mentioned woody species. Other highly disrupted areas such as the dirt and rubble berms on the eastern perimeter of the base and some highly disrupted drainage areas contain invasive weedy species. Improved grounds on the base are planted with common Bermuda grass.

The majority of the over 34 species of trees found on the base are live oak, pecan, and shumard oak. Tree locations are illustrated in Figure 4.5. In 1993, a tree management program was implemented to increase and improve this natural resource on base. Under the Tree Way Program, trees are propagated in the on-base greenhouse and transplanted where needed. Goodfellow AFB has been designated as a Tree City USA for the past four years.

4.2.1.9 Threatened and Endangered Species The Texas Horned Lizard is the only threatened species found at Goodfellow AFB. Although it is being considered for the federal listing, it currently only appears on the state's threatened list. No other plant, animal, or bird species found at this installation is considered to be threatened or endangered.

4.2.1.10 Historic Preservation and Archaeological Resources

The National Park Service cultural resource assessment for Goodfellow AFB indicates there are no historical or archaeological sites of any significance and no base structures eligible for the National Register of Historic Places. The survey suggested that the low potential for intact resources within base boundaries can be attributed to the fact that

nearby locations along the Concho and South Concho rivers were more suitable for early settlement. Also, the land's surface has been disrupted by construction and agricultural activities.

The base does, however, have one locally historic landmark. Gate posts that marked the entrance to the original farmstead remain in their original location. The deed for the sale of the farm to the federal government for the development of the base required that the posts be preserved and maintained indefinitely. The location of the posts are shown in Figure 4.5.

4.2.1.11 Outdoor Recreation Areas An Outdoor Recreation Plan has been implemented to ensure the conservation, use, and protection of the installation's outdoor re-

Gate Posts of Original Farmstead



Revised 14 Apr 99



Figure 4.5

Natural and Cultural Resources



-  Trees
-  Historical Landmark
(Gate Post of the
Original Farmstead)



Lake Nasworthy Recreation Camp

creational resources. As Figure 4.6 illustrates, there are a variety of formal outdoor recreational facilities on base including athletic fields, tennis courts, basketball courts, swimming pools, jogging track, physical fitness course, and an informal cross country jogging area. Goodfellow AFB leases a 15-acre lakeside property at Lake Nasworthy located approximately 10 miles south of the base as shown in Figure 3.2. The area provides facilities for picnicking, camping, softball, basketball, volleyball, horseshoes, and a variety of water sports including swimming, boating, and fishing.

4.2.1.12 Pest Management The success of the base's Pest Management Plan is established through a program of inspections and integrated pest management techniques. The program includes inspection and control of household pests, structural pests, stored product pests, public health pests, ornamental and turf pests, vegetation control, aquatic pests, and Quality Assurance Evaluator monitoring of

pest control contracts. This plan covers all grounds and structures on Goodfellow AFB as well as the Recreation Camp at Lake Nasworthy. Implementation actions are taken on a priority basis with base facilities generally having priority over military family housing. The Base Self-Help Program for military family housing occupants is coordinated through the base housing office and the Civil Engineering Self Pride Service Center. Pesticides and herbicides are stored in Building 744.

Currently there are no significant pest control problems other than typical roaches, fire ants, and mice occasionally found in facilities.

4.2.1.13 Land Management A Land Management Plan and sub-plans have been developed to provide a coordinated program of land management and improvement that allows maximum military use while controlling erosion, protecting natural resources, sustaining productivity of croplands and grasslands, promoting development and management of fish and wildlife, and

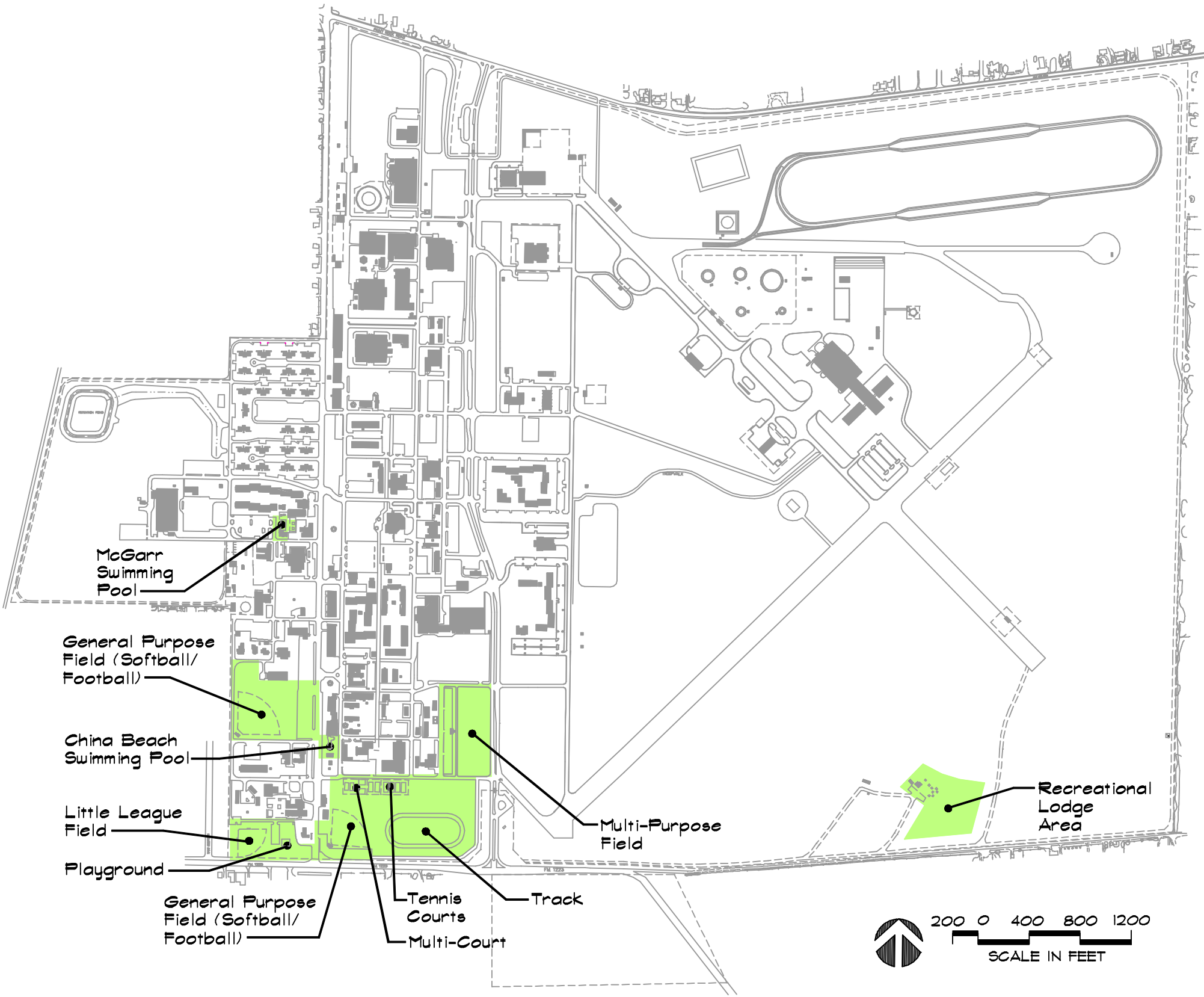


Pest Management

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Figure 4.6

Outdoor Recreation



Outdoor Recreation

encouraging outdoor recreation. It is intended that the actions of this plan interrelate and be compatible with the General Plan, the Land Use Plan, the Fish and Wildlife Plan, and the Outdoor Recreation Plan.

As illustrated in Figure 4.7, the majority of land, approximately 65 percent, is classified as unimproved grounds that receive little to no maintenance. Improved grounds make up about 16 percent of the base. These areas have a regular maintenance schedule for mowing, watering, fertilizing, and the application of pesticides/herbicides. The remaining grounds, approximately 10 percent, are considered semi-improved grounds that are maintained, but on a limited basis.

4.2.2 Environmental Quality

The impact of an area's environmental factors must be considered when planning for future development. The following are important factors that impact Goodfellow AFB and must be considered in the decision-making process.

4.2.2.1 Hazardous Waste/

Materials The majority of hazardous wastes generated at this installation are from vehicle, equipment, and building maintenance activities. Goodfellow AFB is registered as a Small Quantity Generator by the Environmental Protection Agency (EPA) because of the low amounts of hazardous wastes generated.

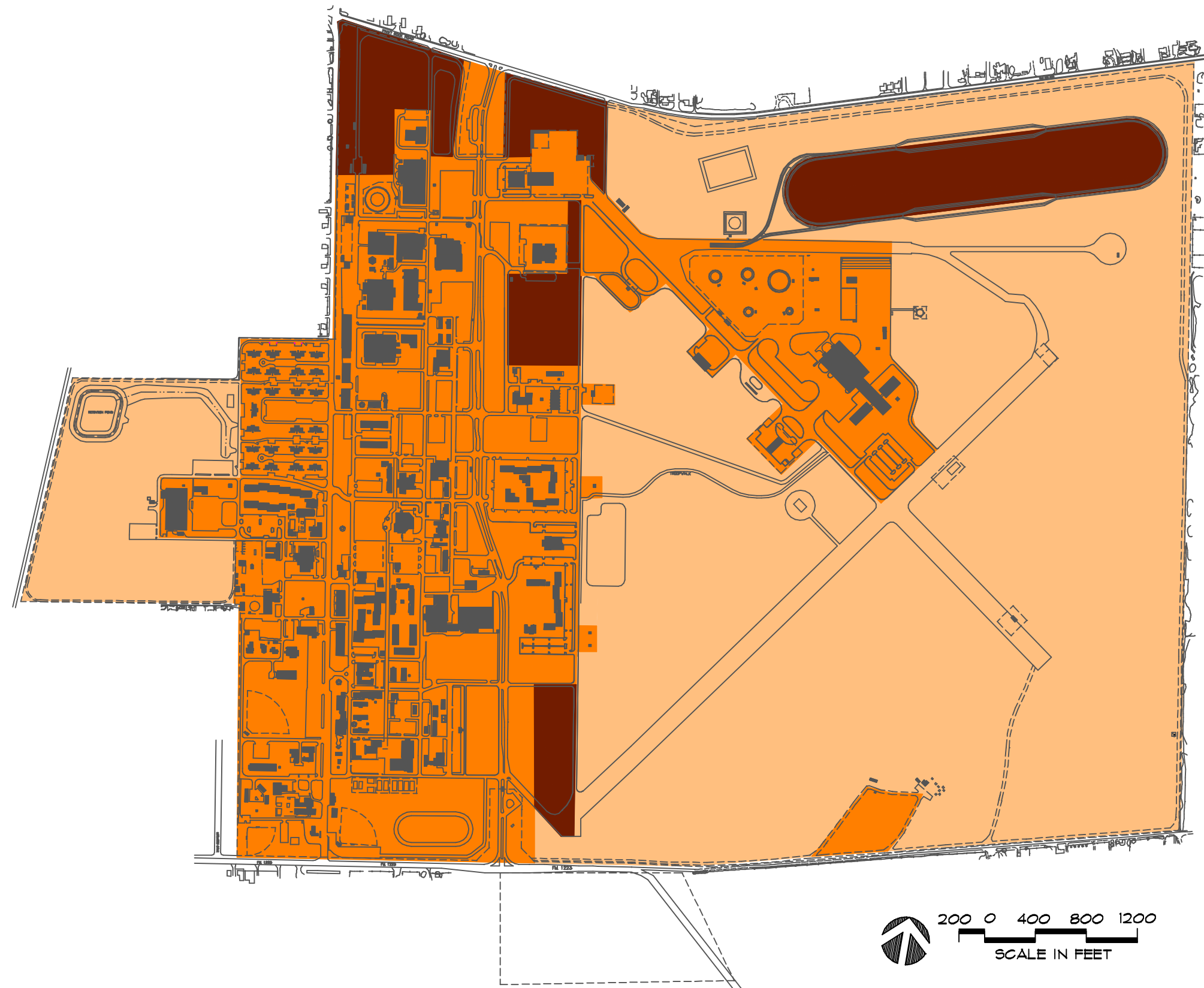
Hazardous wastes are collected at Initial Accumulation Points (IAP) in 55-gallon drums, or up to one quart for acute hazardous materials. These IAP sites are identified in Figure 4.8. Wastes generated at the IAP sites are then transferred to a hazardous waste accumulation site, Building 3530, for temporary storage of up to 270 days until they can be delivered to an off-base disposal site.

Goodfellow AFB uses a computer database system, AF-EMIS, to track the purchase, use, and disposal of hazardous materials. This "virtual" hazardous materials pharmacy monitors materials at each individual supply source. The network eliminates the need for additional manpower or facilities dedicated solely to the pharmacy, and allows command to know exactly how much and where hazardous materials are located on base.

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Figure 4.7

Land Management Areas

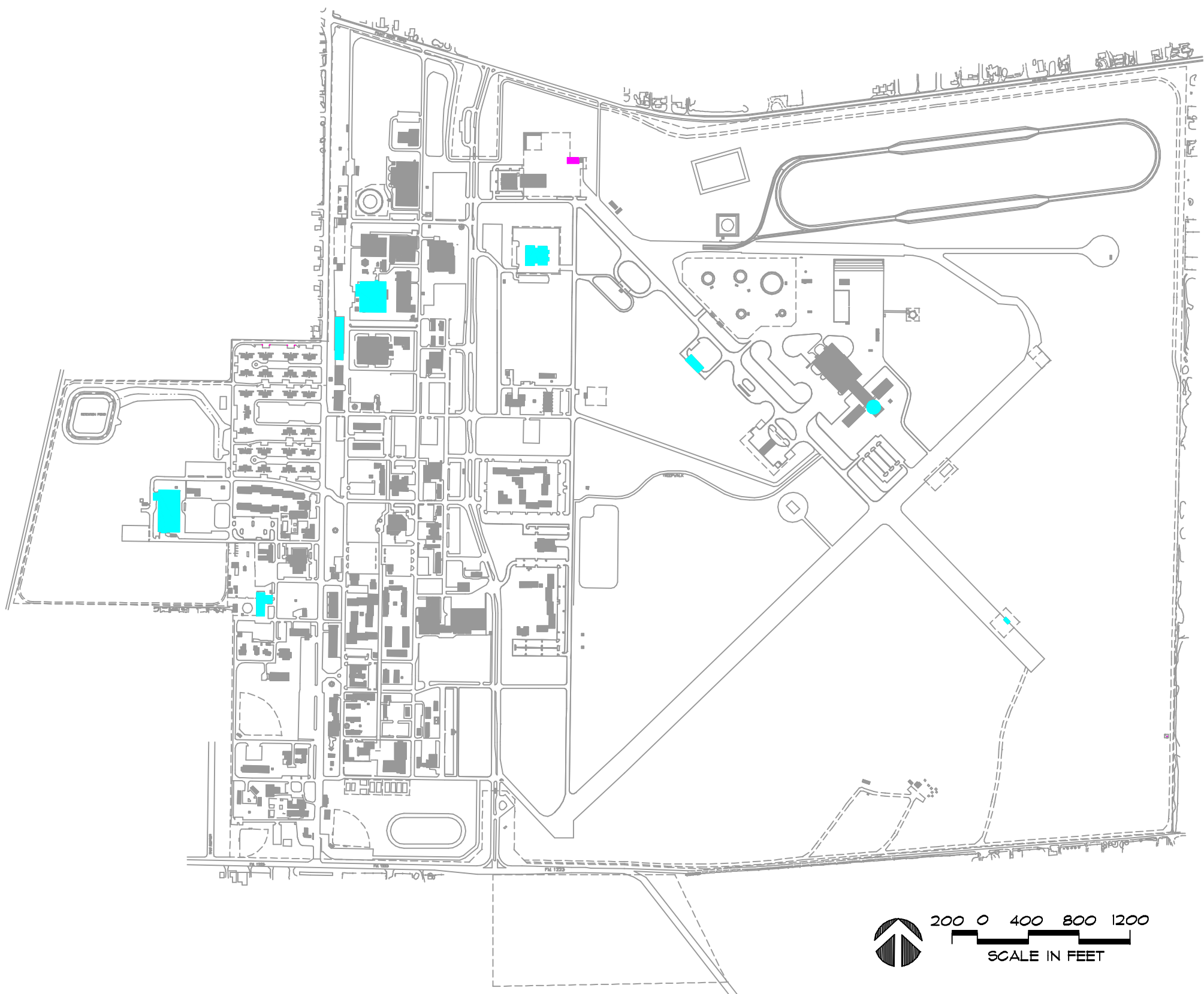




- Improved Grounds
- Semi-Improved Grounds
- Unimproved Grounds

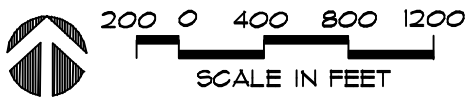
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Figure 4.8
Hazardous Waste Accumulation Sites/Points



 Initial Accumulation Point
 Hazardous Waste Accumulation Site



Base Recycling Facility

4.2.2.2 Solid Waste Disposal and Recycling

All refuse generated at the installation is removed by contractors to the San Angelo Municipal Landfill. Two separate contractors handle solid waste removal from the base. One contractor is responsible for the removal of domestic waste, about 99 percent of the installation's total generated refuse. The other contractor handles waste generated in the base's industrial and work areas.

There are two landfills located on the base that have been capped and closed and are no longer used. Continual monitoring of these sites indicates no environmental problems.

A Solid Waste Management Plan was implemented in April 1994, and in 1995 Goodfellow AFB successfully reached the 50 percent solid waste reduction goal set by the Air Force.

Goodfellow AFB's recycling program is operated by a private contractor through the National Industries for the Severely Handicapped. Weekly pick-ups occur in the housing area and at most base facilities. Every household is provided with recycling containers, however, participation in the program is on a voluntary basis. Recyclable materials may also be dropped off at the designated recycling center, Building 504. Nearby Building 512 acts as a storage area for recyclable papers until they can be picked up. The recycling program has expanded to include the 200 off-base housing units at Lake Nasworthy.

*Recycling Trailer*

4.2.2.3 Storage Tanks Goodfellow AFB was the first AETC installation to meet the 1998 UST compliance requirements set by the Air Force. The installation presently has four underground storage tanks (USTs) and seven aboveground storage tanks (ASTs) located on base, locations are shown in Figure 4.9. Three of the ASTs are unique as they are enclosed in individual concrete vaults that are underground. These vaulted tanks were constructed in anticipation of the AAFES service station relocation, thereby allowing the storage tanks

to be removed to the new location. There are 3 Areas of Concern (AOCs) that are the result of UST's on base. These UST's have been removed and proper measures are being taken to clean up the areas. AOC-07 and AOC-08 were both closed in July after a Texas Petroleum Storage Tank (PST) Investigation/Assessment was completed. AOC-09 is currently waiting funding. It is important to note that these three AOCs are not eligible for ERA funding since contamination did not occur exclusively prior to 1984.

Site	Description
AOC-7	Building 520 UST- Generator tank
AOC-8	Building 716 UST- Old CE Yard
AOC-9	AAFES Tanks 904-1, 904-2, 904-3, 904-5

4.2.2.4 Installation Restoration Program In an effort to protect the environment and human health, the USAF developed the Installation Restoration Program (IRP) to identify, investigate, clean up, and ultimately close out areas with histories of hazardous waste spills or

disposal. Goodfellow AFB has identified a total of five IRP sites and nine AOCs (in addition to the three above AOCs) since the implementation of the program. Figure 4.10 identifies the location of these sites, and the following list gives the site number and a brief description of each.

Site	Description
LF-01	South Landfill - Pit landfill used for construction debris.
LF-02	Southeast Landfill - Trench landfill for municipal trash.
SS-03	Drum Storage Area - Open storage area for 55-gallon drums.
ST-04	Fuel Storage Area - USTs for storage of aviation fuel.
ST-05	Buried Tank Area - USTs for fuel storage for military service station.

Of the five known sites, three of these sites have Record of Decisions (RODs) or Decision Documents (DD) that have been evaluated for “No Further Response Ac-

tion Plan” (NFRAP). Work will continue on the other two sites until a ROD or DD determines that a NFRAP can be performed.

The following is a list of nine AOCs that are eligible for ERA funding.

Site	Description
AOC-001	Small Arms Firing Range/ Skeet Range
AOC-002	Aircraft/Vehicle Wash Racks
AOC-003	Flightline Runoff Areas, Outfalls and Storm Drains
AOC-004	Lake Nasworthy Former ASTs
AOC-005	Maintenance Facilities
AOC-006	Railroad Tracks
AOC-010	Refueling Pits and Piping
AOC-011	Former Landfill
AOC-012	Landfill Trench

Once an AOC is located, a Preliminary Assessment/Site Investigation (PA/SI) is performed to determine the extent of contamination. Final PA/SIs have been completed for AOCs 002 & 010, draft PA/SIs have been completed for AOCs 001, 003, 004, 005, and 006, and draft PA/SIs will be completed for AOCs 011 & 12 in 1999.

The survey found that criteria pollutant emissions and hazardous air pollutant emissions were below recommended action levels. Based on this information, it was determined that Goodfellow AFB is not considered a major stationary source for air emissions. The entire multi-county region is considered to have low levels of air pollutants.

After the PA/SI is completed, the results will either support a ROD or DD to obtain a NFRAP or the results will show that further action is required before a NFRAP can be completed.

4.2.2.5 Air Emissions Sources A recent air emissions inventory identified air emission sources and determined the actual and potential pollutants each source releases. Installation air emission source locations are illustrated in Figure 4.11.

4.2.2.6 Wastewater and Stormwater Discharge Goodfellow AFB discharges its wastewater into the city of San Angelo’s sanitary sewer system, with the exception of three small on-site septic tank/absorption systems. The gravity flow system discharges approximately 91 to 110 million gallons per year of domestic sewage into the city sewer system from three different points on base. These discharge points are monitored through the quarterly sampling.

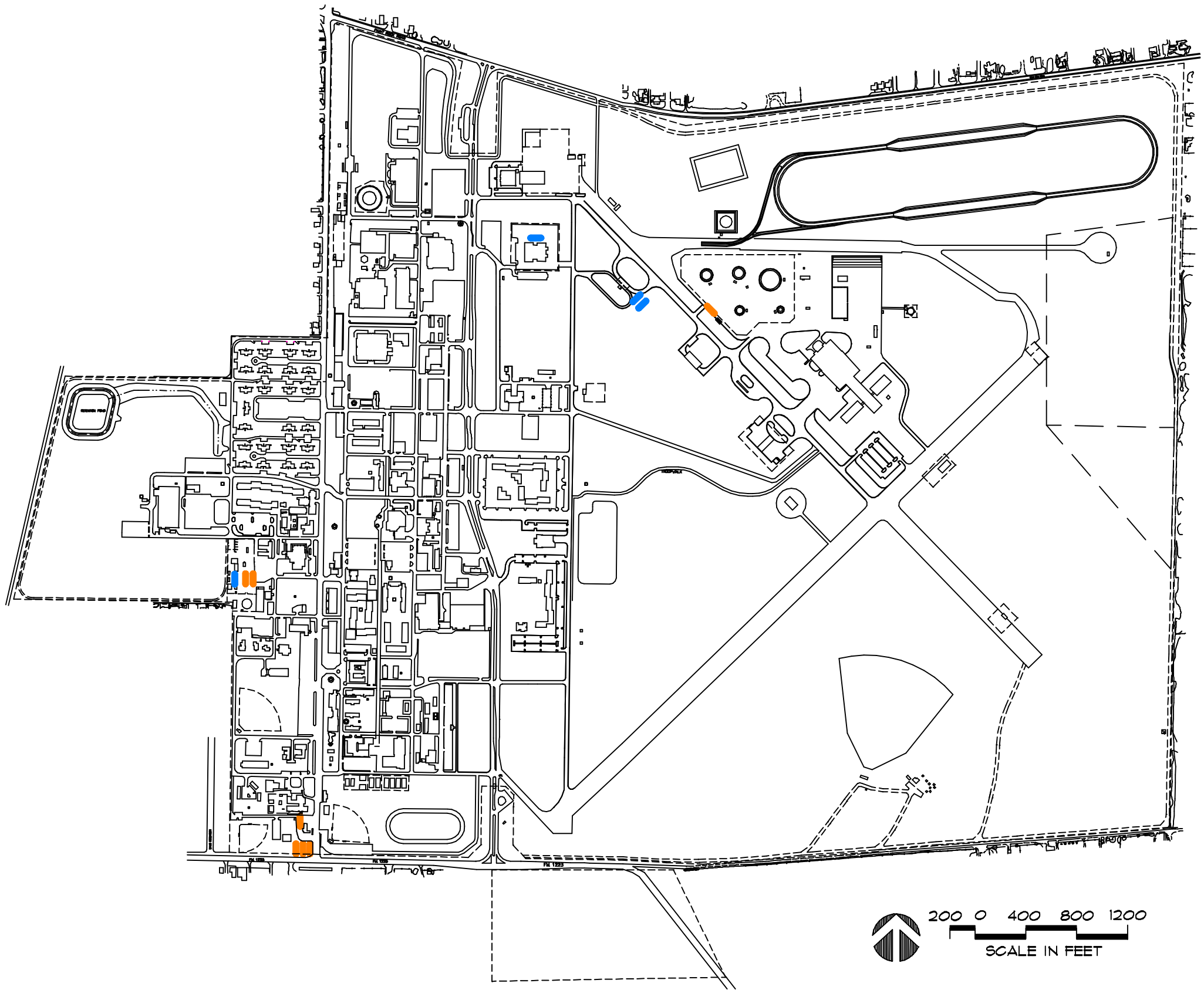
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Figure 4.9

Aboveground and Underground Storage Tanks

- Underground Storage Tank
- Aboveground Storage Tank (Includes Below-Surface-Vaulted Tanks)

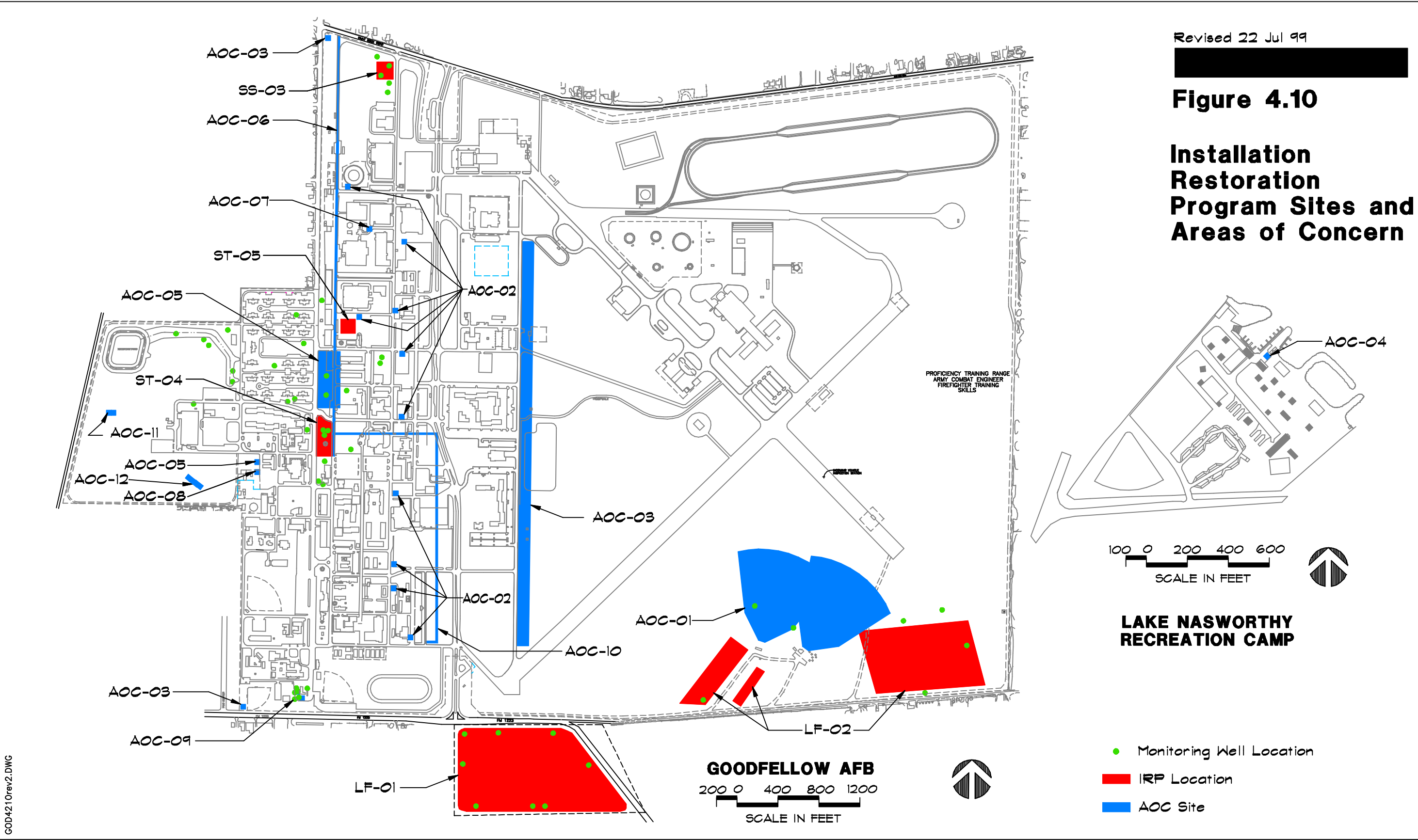
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Figure 4.10

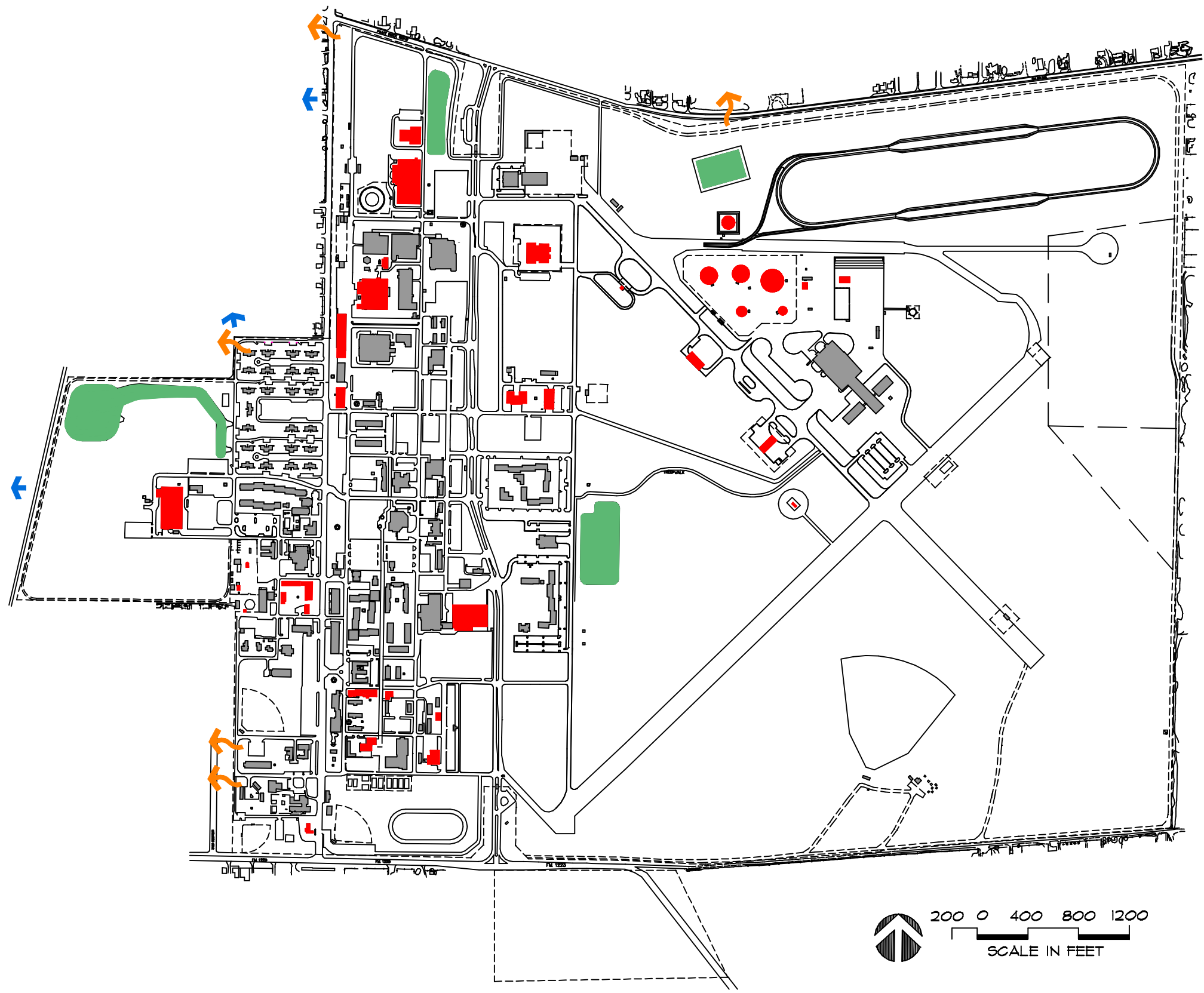
Installation
Restoration
Program Sites and
Areas of Concern



Revised 13 Oct 99

Figure 4.11

Additional
Environments
Issues



- Air Emission Source
- ← Wastewater Discharge
- Detention Basin
- ↗ Stormwater Discharge

Fire Training Complex

ing conducted by Bio-environmental Engineering at the three sanitary sewer outfalls. Refer to Figure 4.11 for these locations.

Stormwater runoff generated in the main cantonment area is channeled through underground drainage pipes, open surface ditches, and street curb and gutters to one of five outfalls from the base. There also are three detention ponds located on base that detain stormwater during periods of heavy rains. The former airfield area collects runoff in a series of catch basins and underground drainage pipes that empty

into an open channel running along the east and north boundaries before it is discharged off of the base. Only visual monitoring of stormwater pollutants is performed by Civil Engineering, Environmental Flight, as no sampling is required.

Water used for training exercises and stormwater runoff in the Fire Training Area is collected and continually recycled back to the 500,000-gallon storage tank, and reused. Occasionally surpluses are discharged to the sanitary sewer.

4.2.2.7 Drinking Water Supply

All potable water is obtained from

Lake Nasworthy

the city of San Angelo. The city's water treatment plant receives its water from local reservoirs: O.C. Fisher, Twin Buttes, and Lake Nasworthy. In addition, there are two alternative water supply sources available: Lake Spence, located 35 miles north of the city; and a new reservoir, O.H. Ivie, located about 40 miles to the east.

Potable water is supplied to Goodfellow AFB through three separate water mains at a pressure of 65 pounds per square inch and stored in two 400,000-gallon elevated water towers.

Base drinking water is sampled weekly by Bio-environmental Engineering for bacteriological contamination, while sampling for lead, copper, and asbestos is conducted annually. All other contaminants are monitored by the city of San Angelo at the treatment plant.

4.2.2.8 Electromagnetic Radiation Sources The base has 17 radio transmitters located on seven towers and buildings at various locations. None of the transmitters present a known hazard.

4.2.2.9 Radon Emissions Only four family housing units were found to exceed EPA recommended radon levels. Modifications have been done to these residences to achieve acceptable levels.

4.2.2.10 Asbestos An asbestos containing material survey was conducted in 1993, covering over 200

base facilities. The survey revealed over 350 different asbestos containing materials existing at varying degrees in some of these facilities. The areas considered to be high risk, typically mechanical rooms containing boilers, ducts, pipe fittings, thermal insulation, and various tanks and other mechanical equipment, have since been abated. Remaining low risk areas containing materials such as floor tiles, linoleum, wall plaster, and batt insulation are being abated during scheduled facility renovations or when required due to deterioration.

4.2.2.11 Lead Based Paint (LBP)

Two separate surveys for base LBP were conducted in 1993 and 1994. The first survey revealed LBP contamination in a few industrial facilities, several pre-1980 non-industrial facilities, and a majority of the military family housing units surveyed. The later study found that 75 percent of the WWII-era buildings surveyed contained hazardous levels of LBP. Abatement of problem areas is done during scheduled demolition, renovation projects, or as facilities are repainted. The outside surface of the shorter of the two on-base water towers is the largest source of LBP at the installation.

4.2.2.12 Polychlorinated

Biphenyl (PCB) The base is considered to be PCB-free. However, light ballasts located throughout the installation buildings are assumed to be PCB-contaminated unless labeled as PCB-free. Therefore, as

facility repairs and renovations occur, the ballasts are removed and properly disposed.

4.2.3 Safety Criteria

There are three areas that require designated safety clear zones: an explosive storage facility, an outdoor firing range, and a suspect vehicle holding area. The explosive storage facility is used to store munitions in support of the security forces squadron. The storage facility has a required Quantity Distance (QD) explosive safety zone, sited through headquarters and Air Force, surrounding the facility. The outdoor firing range is no longer used, and a complete phase out and clean up of this facility is planned, thus eliminating the need for its small arms clear zone. The third clear zone surrounds the suspect vehicle holding area. This clear zone surrounding the suspect vehicle holding area is required in the event an explosive

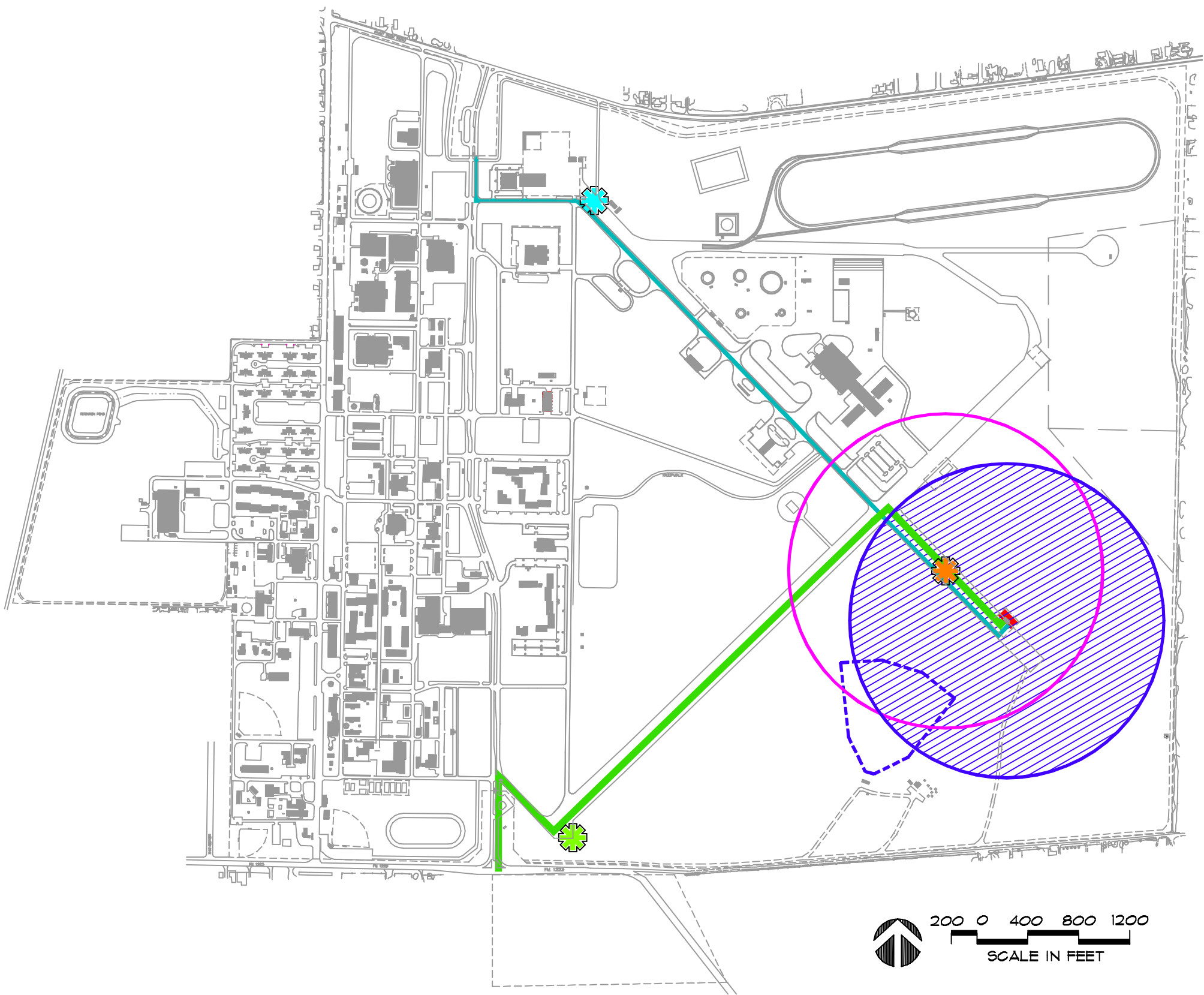
laden vehicle's cargo is suspected unstable or defective in any manner. All safety clear zones are located in the former airfield area, and no manned facilities are located within their limits. The security forces operation facility is licensed to contain small amounts of explosives but is not required to have associated QD explosive safety zones.

A primary explosive route is used to bring commercial or military vehicles carrying explosives to the munitions storage area. The secondary explosive hauling route provides a safe means of ingress/egress to the base in the event that the primary route becomes impassable.

Figure 4.12 delineates the safety clear zones, facilities storing explosives, and the primary movement route.

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Figure 4.12
Explosives
Safety Criteria
Areas



- Primary Explosives Route
- Alternate Explosives Route
- Authorized Explosives Storage Facility
- Quantity Distance Explosives Safety Zone
- Clear Zone - Suspect Vehicle Holding Area
- Clear Zone - Outdoor Firing Range
- Suspect Vehicle Holding Area
- Primary Explosive Vehicle Inspection Area
- Alternate Explosive Vehicle Inspection Area